

First - Sorry for my basic english.

Last year I have wrote in several posts how to activate my Vulkan Mk4 loudspeaker by a HTPC with open source software xover, HDMI and a 7.1 AV-Receiver here, but all in German language:
http://www.hifi-forum.de/index.php?action=browseT&forum_id=104&thread=28633

Then I wanted to configure the same on a Amlogic S905 Mini PC (Odroid C2).
 But up to now I was not successful because the HDMI multichannel driver don't work for me.

Now I have got a used Laptop with a defect harddisk for free.
 So why not use the Laptop as a xover.
 I bought a new Samsung SSD 750 EVO 120GB for arround 60 Euro and have now a fully functional laptop.
 I want to run the x-over with this laptop.

The Laptop does not have HDMI but it has Display Port.
 You have to check if Multichannel is supported by the laptops display port.
 Not all Laptops will support this

I bought a DP to HDMI adapter.
 You have to check that is HDMI Audio is supported by the adapter
 I have read not all adapters will work.

Better use a laptop with HDMI.

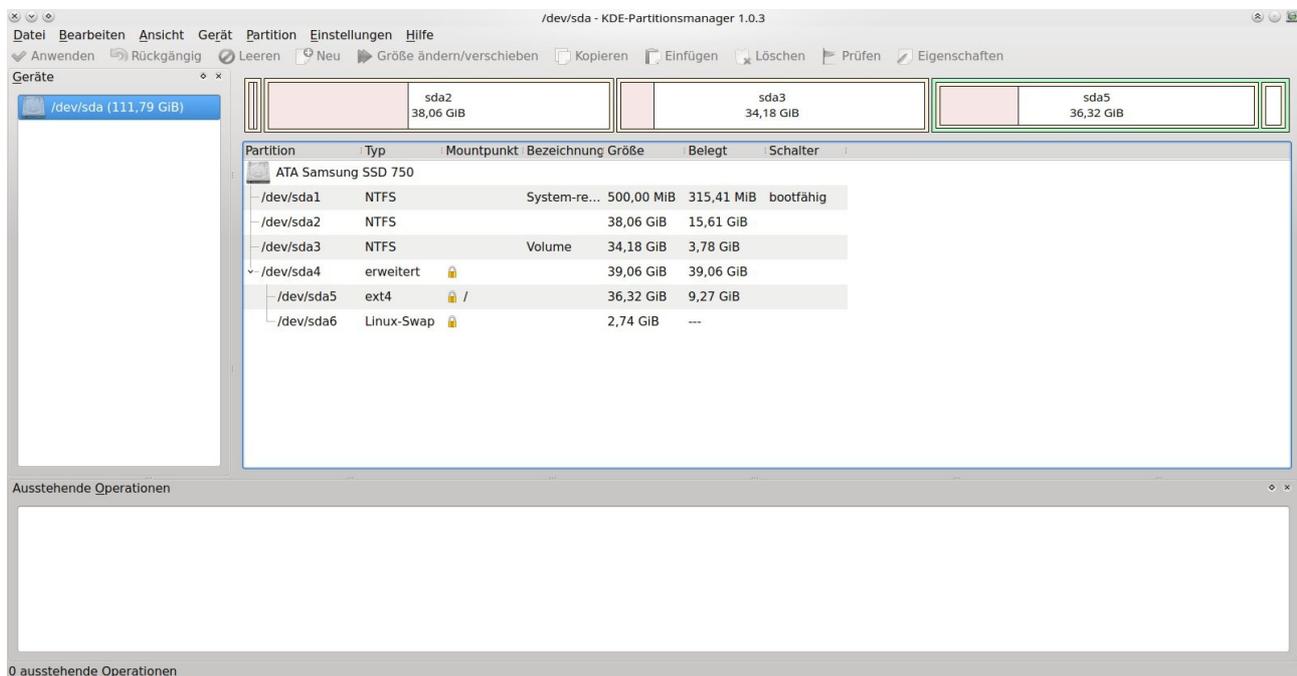
I want to install Windows and KXStudio as a multi boot system on this laptop.

This is what I did for installing the multi boot system:

With the existing Windows 7 licence of the Laptop I could install Windows 10 before end of July 2016.
 The Windows setup will create 2 partitions on the MBR type disk.

Then start the live system of Linux Mint KDE (actual 17.3 Rosa 64 bit) from DVD.
 Start KDE Partion Manager.

I will see 2 partitions sda1 and sda2.
 I will modify the partition as follows:
 Reduce the size of the Windows partition to 38 GiB (sda2).
 Create a new partition of 34 GiB for data (sda3) with NTFS file system.
 Create a new extended partition for the rest of space (sda4).
 Create a new linux partition (ext4) of 36 GiB for the linux root system (sda5).
 Create a new swap partitions for the rest of space (sda6).



Next steps are:
 Install Linux Mint on sda5 by using expert partitioning tool (not the complete disk).

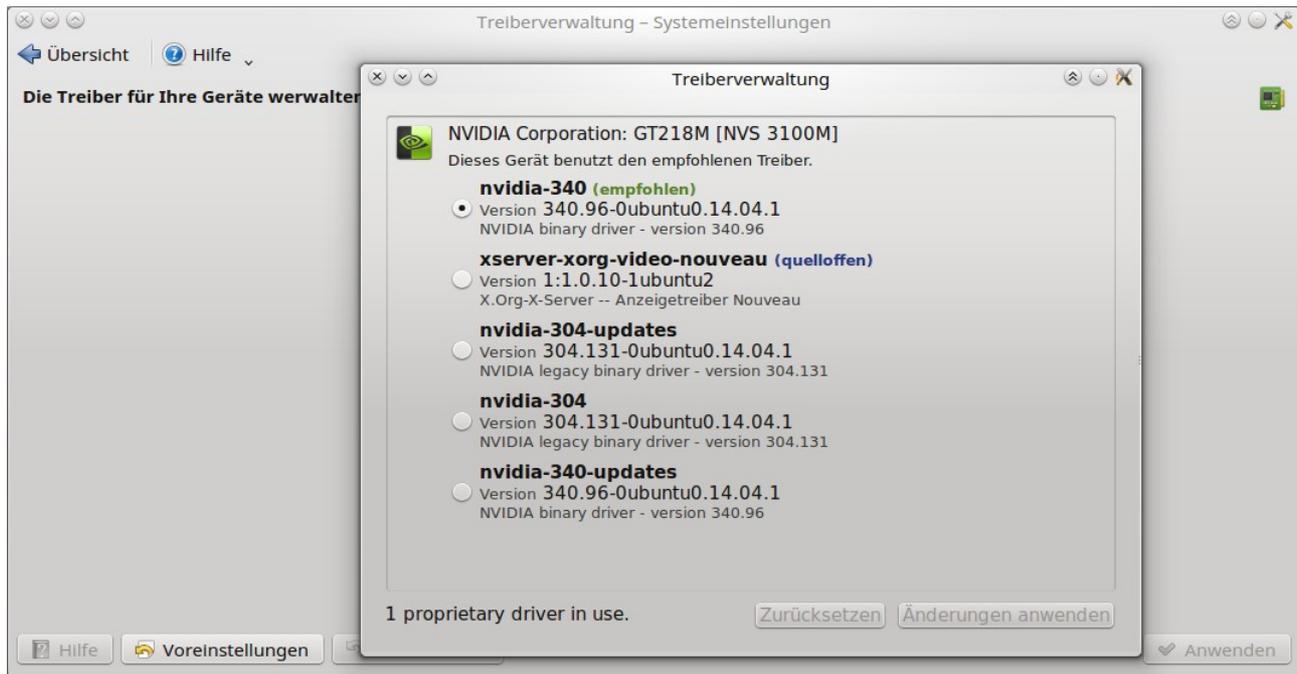
Boot the system into the installed Linux Mint
 Open terminal and write the following commands in <>
 Update with:
 <sudo apt-get update>
 <sudo apt-get upgrade>

Install some additions:

```
<sudo apt-get install mc clementine kde-config-grub2 >
```

With the NVIDIA nouveau driver multichannel would not work.

Install the NVIDIA proprietar driver - here nvidia-340 for NVS 3100M

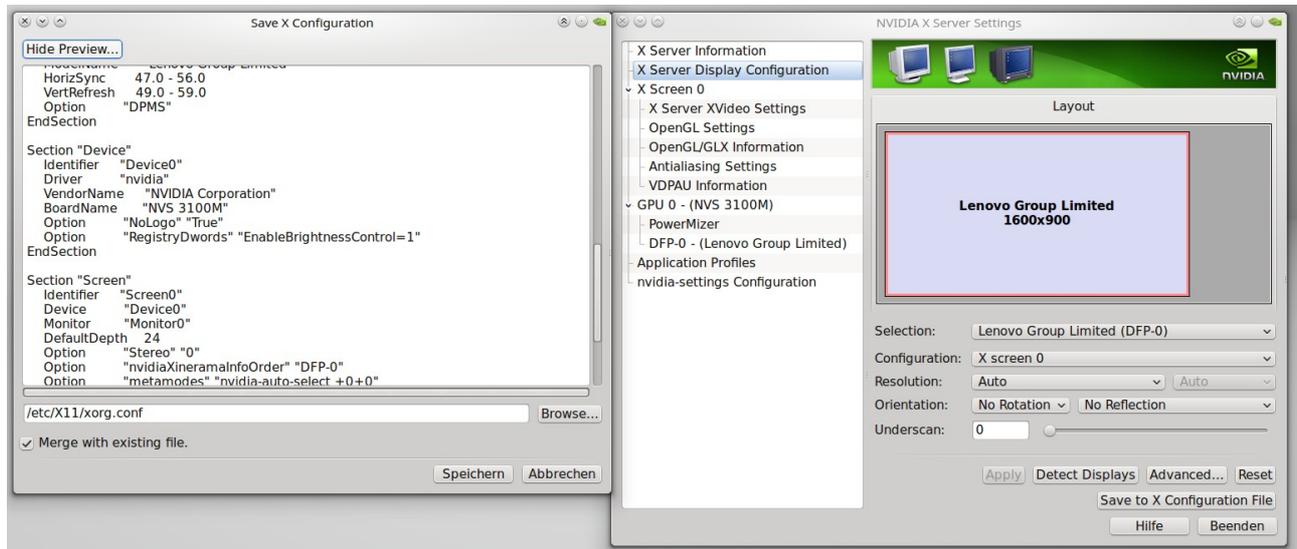


In terminal start `<sudo nvidia-settings>`

Save the X Configuration file (`/etc/X11/xorg.conf`).

For that the brightness adjustment will work and no NVIDIA Logo at startup add to this file:

```
Section "Device"
    Identifier      "Device0"
    Driver          "nvidia"
    VendorName     "NVIDIA Corporation"
    BoardName      "NVS 3100M"
    Option         "NoLogo" "True"
    Option         "RegistryDwords" "EnableBrightnessControl=1"
EndSection
```



For NVIDIA here is an interesting link about HDMI Audio and solving problems.

<ftp://download.nvidia.com/XFree86/gpu-hdmi-audio-document/gpu-hdmi-audio.html>

Install KXStudio inside Mint for example acc. the following discriptions:

<https://linuxmusicians.com/viewtopic.php?t=9666>

<https://forums.linuxmint.com/viewtopic.php?t=178572>

I have done as follows:

Original Repositories are here:

<http://kxstudio.linuxaudio.org/Repositories>:

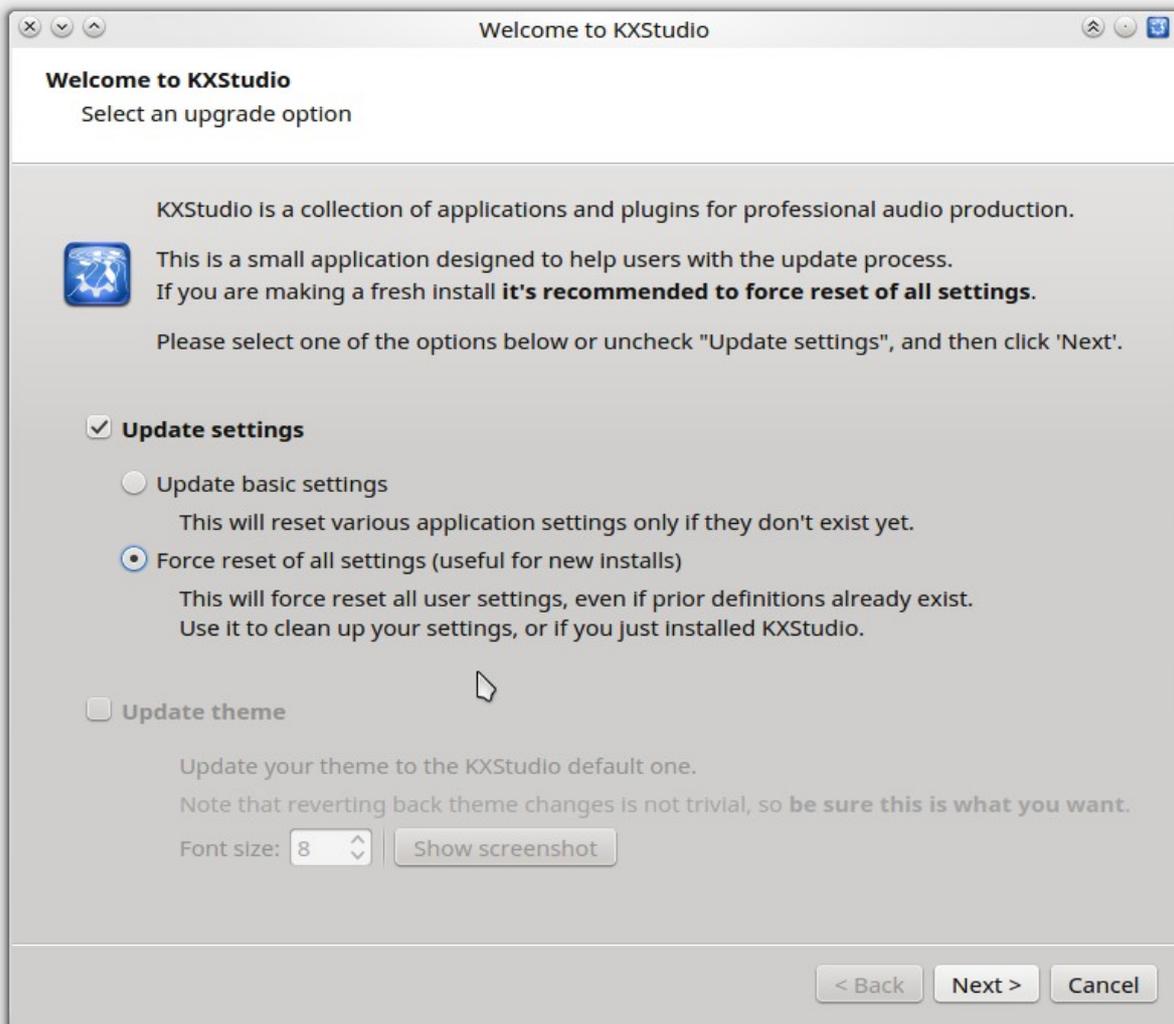
Actual (13.06.2016) the terminal commands are as follows:

```
<sudo apt-get install apt-transport-https software-properties-common wget>
<wget https://launchpad.net/~kxstudio-debian/+archive/kxstudio/+files/kxstudio-repos_9.2.2-kxstudio1_all.deb >
<sudo dpkg -i kxstudio-repos_9.2.2-kxstudio1_all.deb>
<sudo apt-get update>
<sudo apt-get upgrade>
<sudo apt-get install libjack-jackd2-0 qjackctl>
<sudo apt-get install jackd2>
<sudo apt-get install kxstudio-desktop-base>
<sudo apt-get install kxstudio-meta-all>
<sudo apt-get install indicator-cpufreq libcpufreq0 pulseaudio-module-jack>
<sudo apt-get update>
<sudo apt-get upgrade>
```

Install the lowlatency kernel:

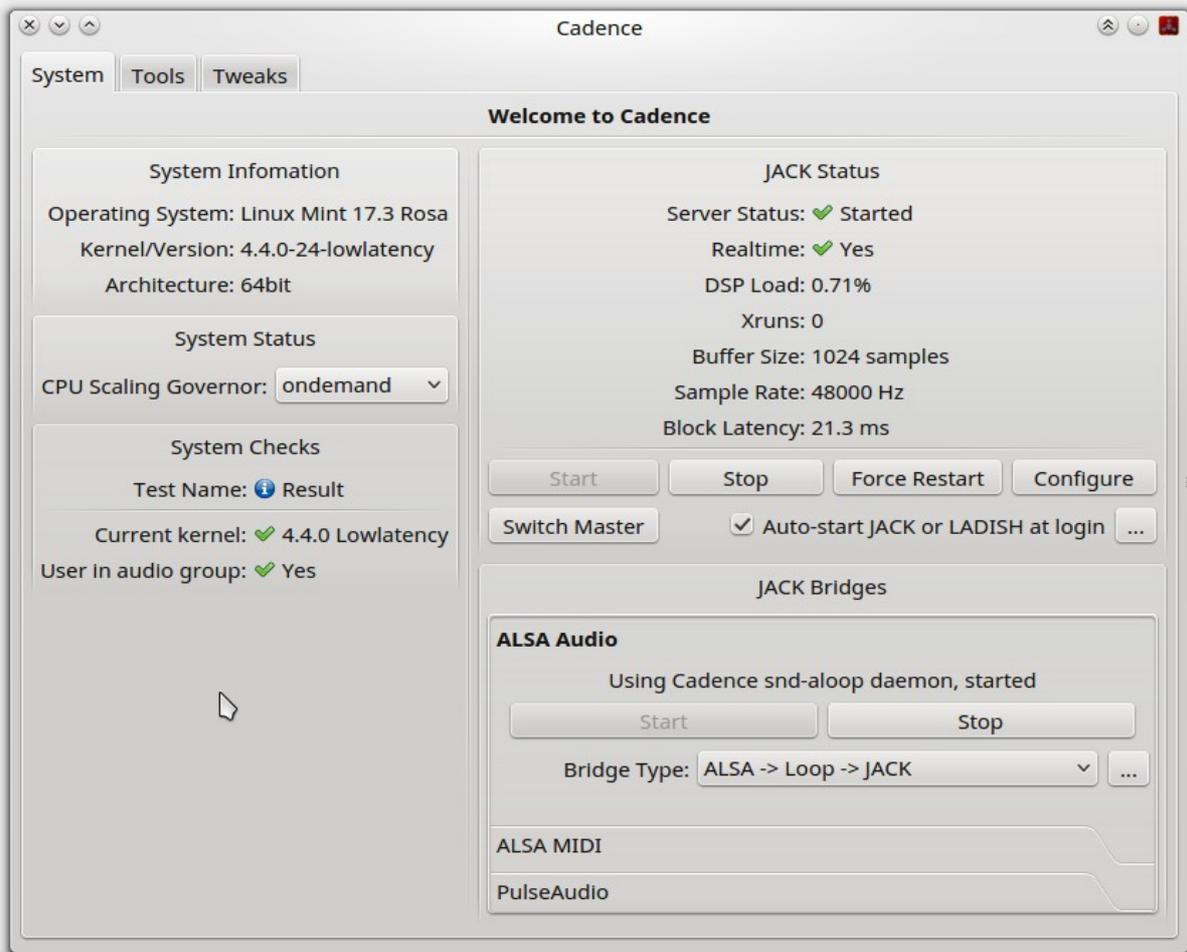
```
<sudo apt-get install linux-lowlatency>
or - I install 4.4 Kernel:
<sudo apt-get install linux-lowlatency-lts-xenial>
```

Run „KXstudio Welcome“ and „Force reset of all settings“.

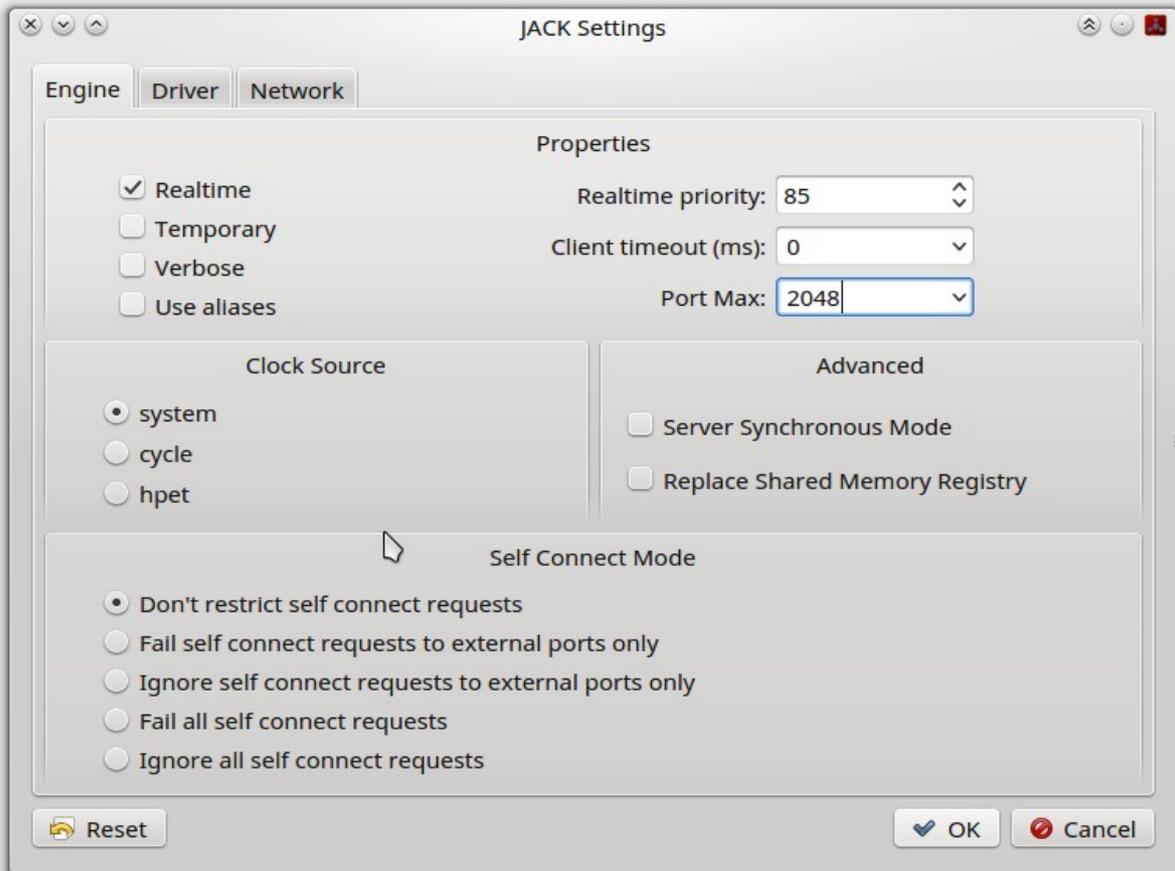


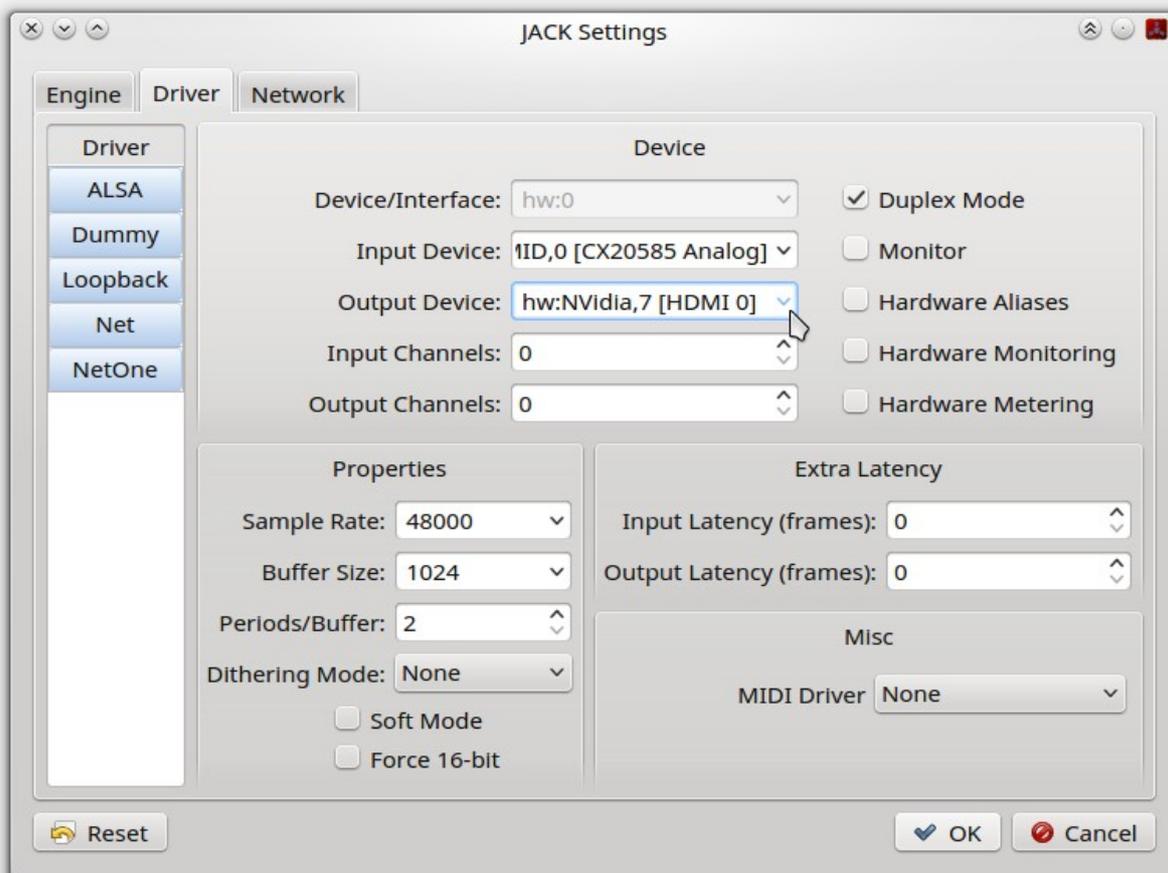
Shutdown and boot the system. At Grub boot prompt select Linux.
Complete Booting takes for me around 1 min including input of the password.

Open Cadence
My settings are as follows:



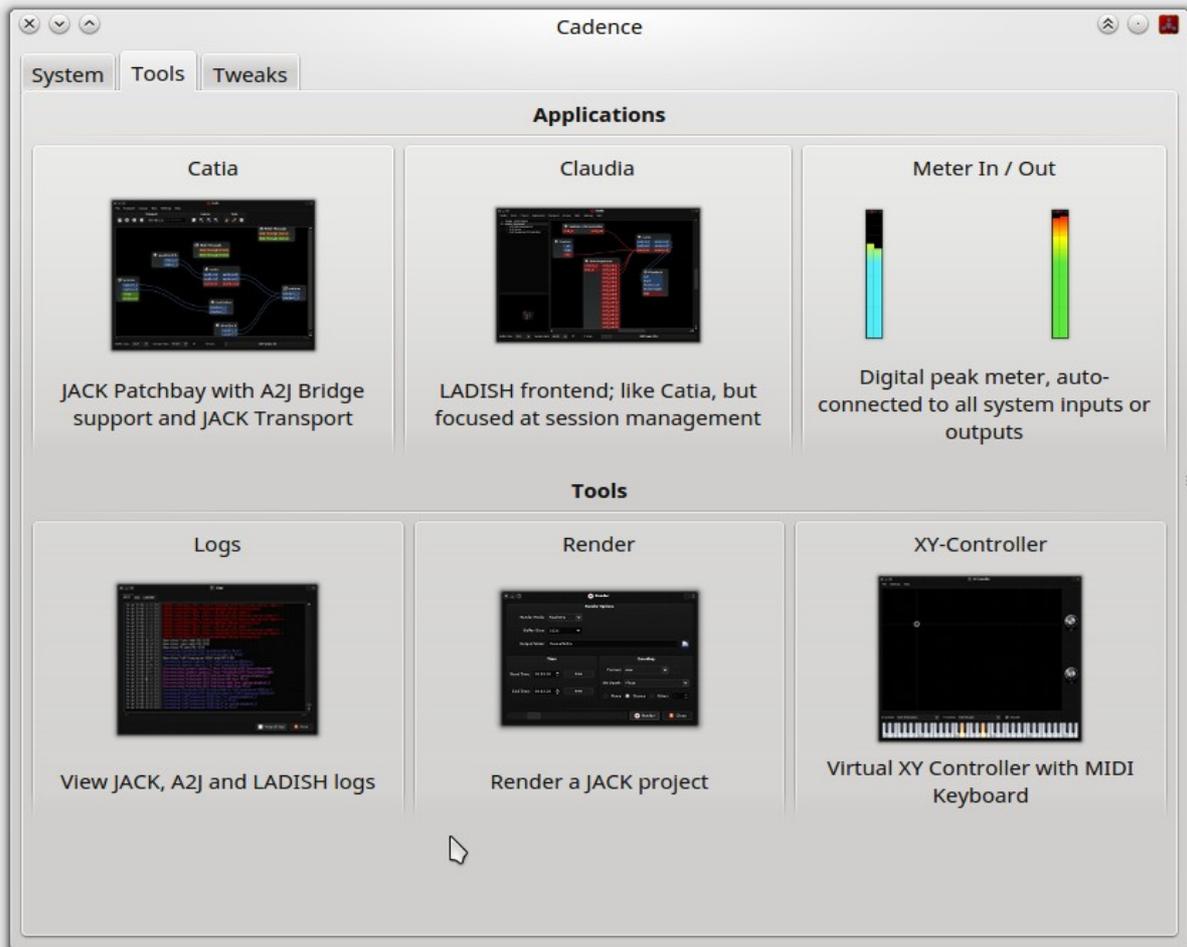
Switch button Configure:





I have to find the right NVIDIA (3,7,8,9) codec as described here:
<ftp://download.nvidia.com/XFree86/gpu-hdmi-audio-document/gpu-hdmi-audio.html>

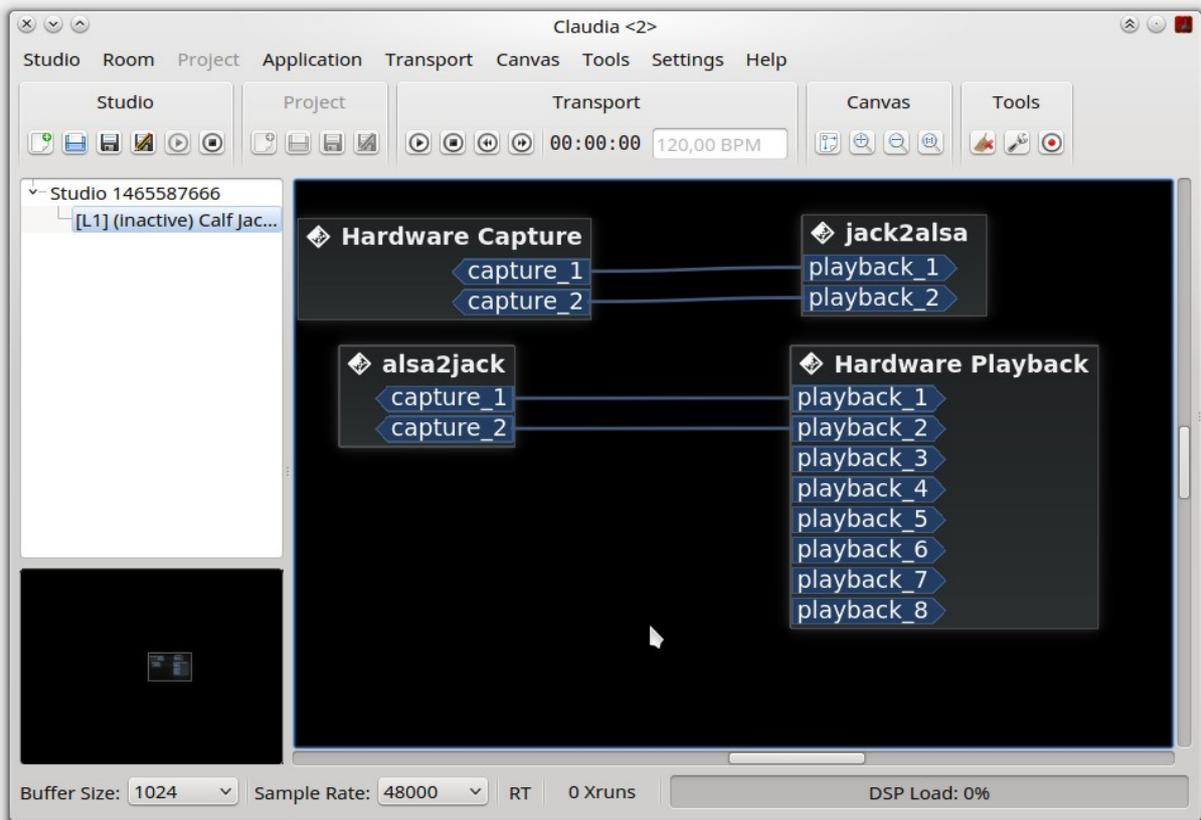
Buffer size, latency and Xruns belongs together
In Cadence latency can be adjusted.
It is a balance between buffer size and getting Xruns.
This will vary for each computer system.
Xruns have to be avoided. And best shall stay at 0.
To avoid Xruns take a look here:
<http://wiki.linuxaudio.org/wiki/latency>
For my system with a buffer size of 512 samples I don't get any Xruns and have a latency of 12 ms.
With a buffer size of 1024 I have a latency of 21 ms.
That is okay for my needs.



Select Claudia

Claudia will open

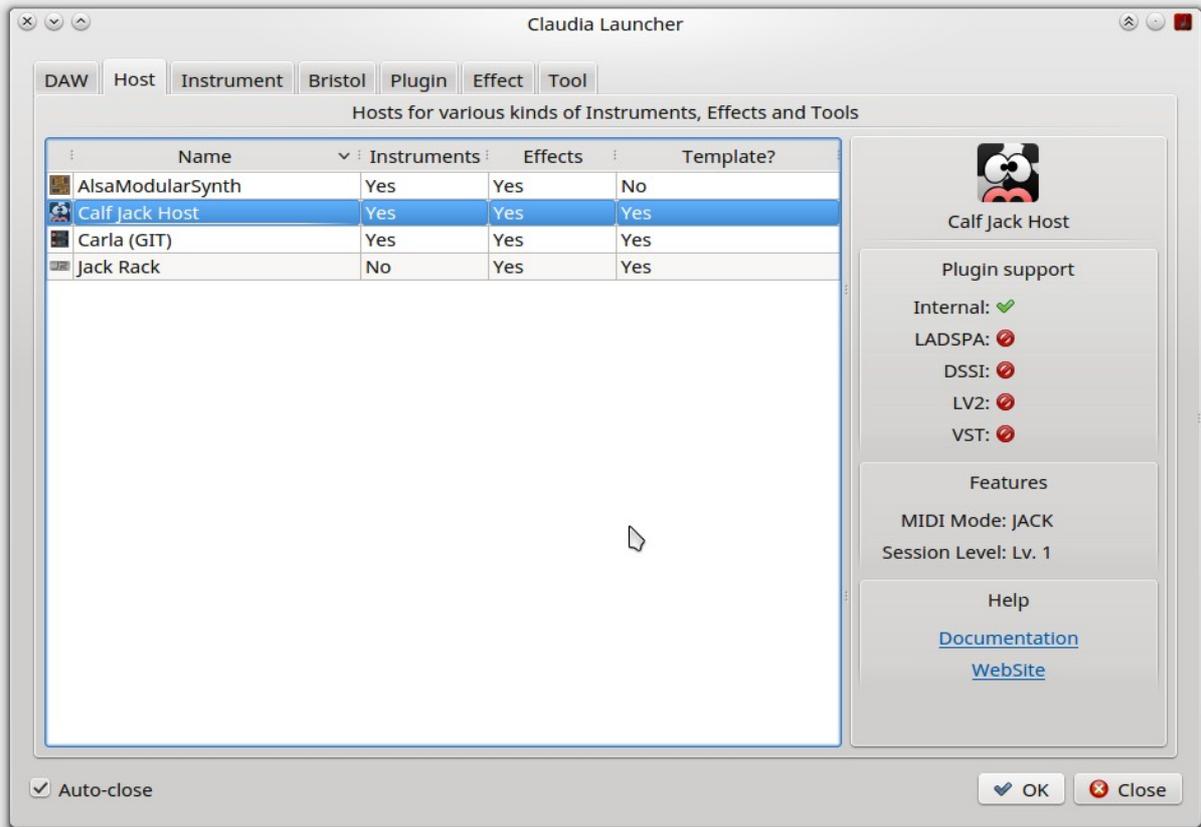
Here you see my Claudia without any plugin open.



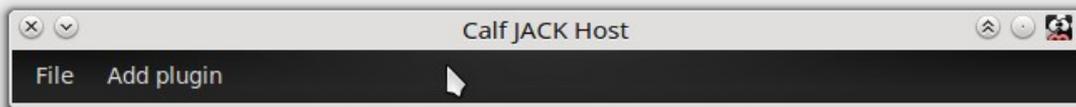
Delete the channel mappings (Right Click to the elements)

Goto Application
Add New

Goto Tab Host



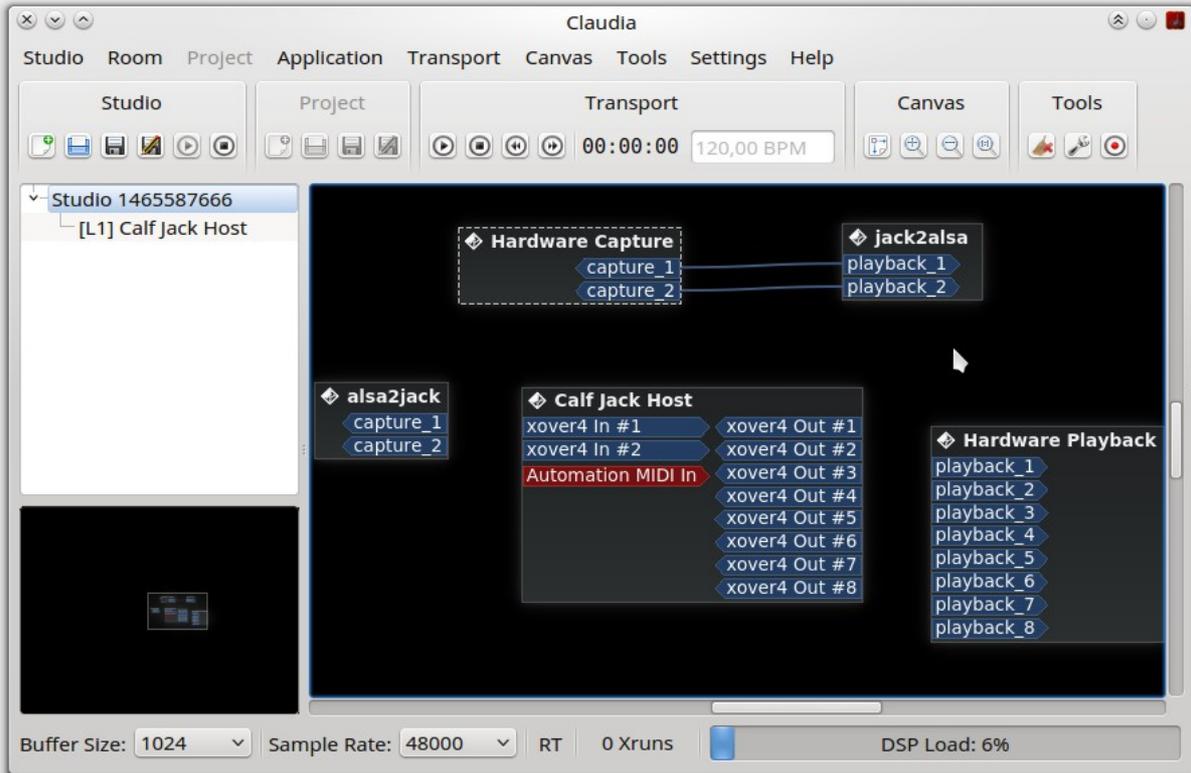
Select Calf Jack Host and OK.



Add plugin, Utility, X-Over 4 Band



Now Claudia looks as follows:

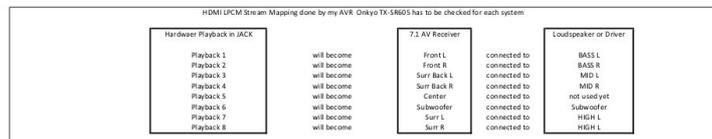
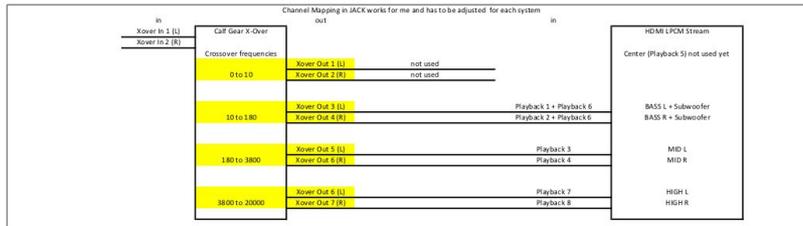
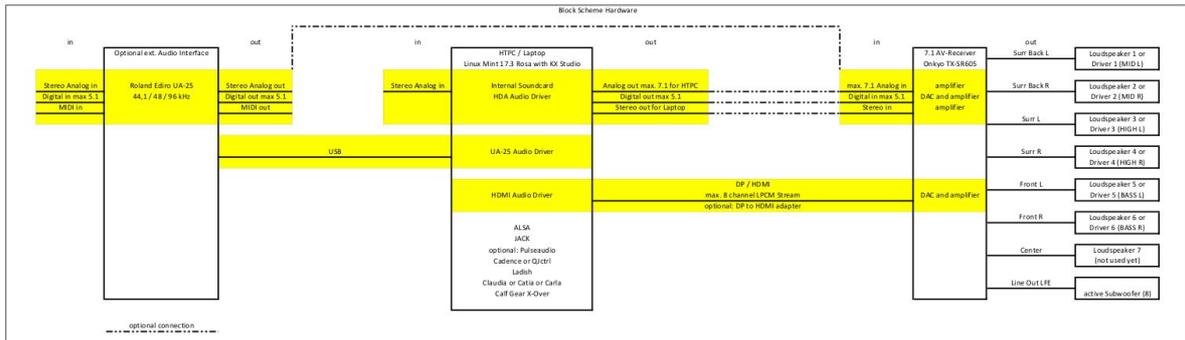


Press EDIT in Calf and X-Over Setup window will open:

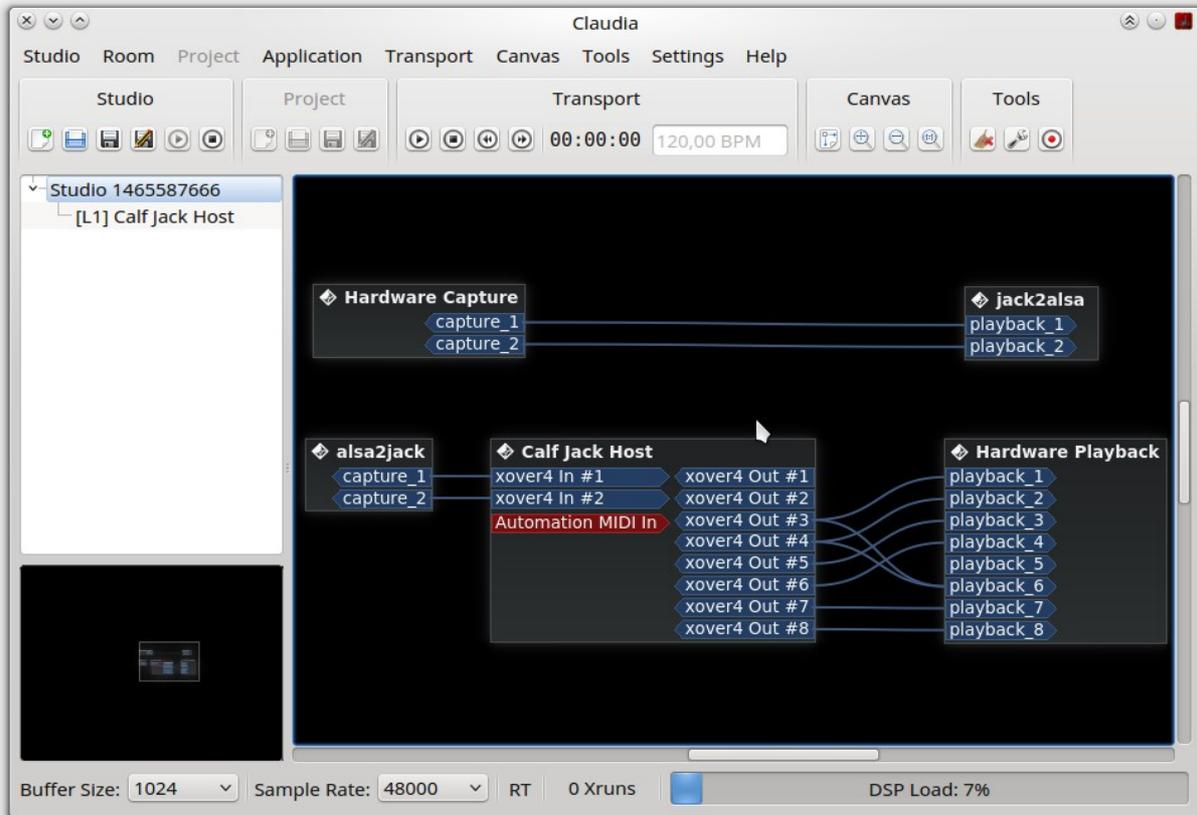


X-over settings can adjusted here for my needs.

BTW. Here some Block schemes I have made for my needs:



Make the channel mappings in Claudia. For me it looks like this in a simple form without equalizer and limiter:



This takes only a few seconds.

It is possible to add also equalizers and limiters and other things.
Save the Studio in Claudia.

One thing has to be considered.

At boot time allway a connection between aksa2jack and Hardware Playback will be established.
This will bypass the x-over.

A solution for this problem can be find here:

<https://linuxmusicians.com/viewtopic.php?t=14151>

Now I have a running Xover with open source software.

All stereo streams will be split by the xover in 6 channels (8 are possible).

The whole connection chain will be digital.

DAC will be done by the AV Receiver with its high quality DA converter.

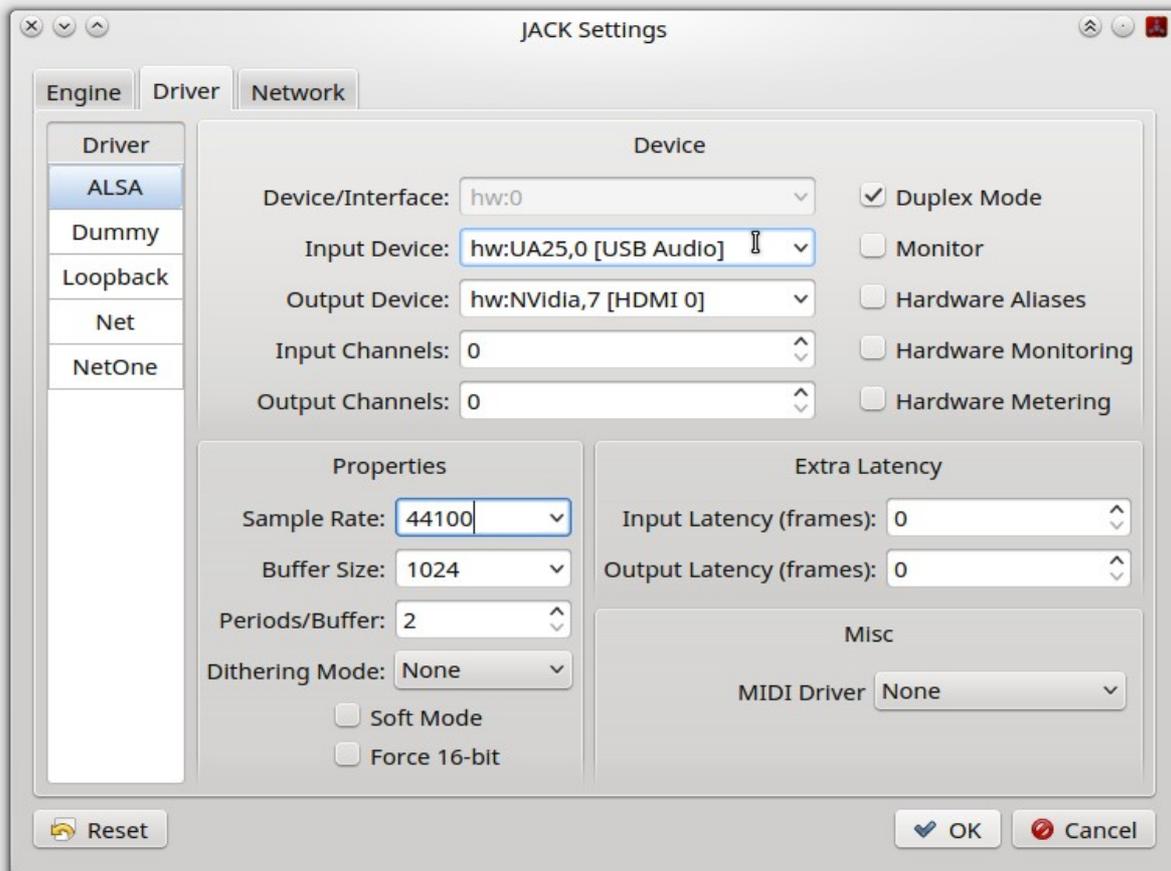
I have measured the latency of the complete system as follows:

In my equipment also is a USB sound interface "Roland Edirol UA-25".

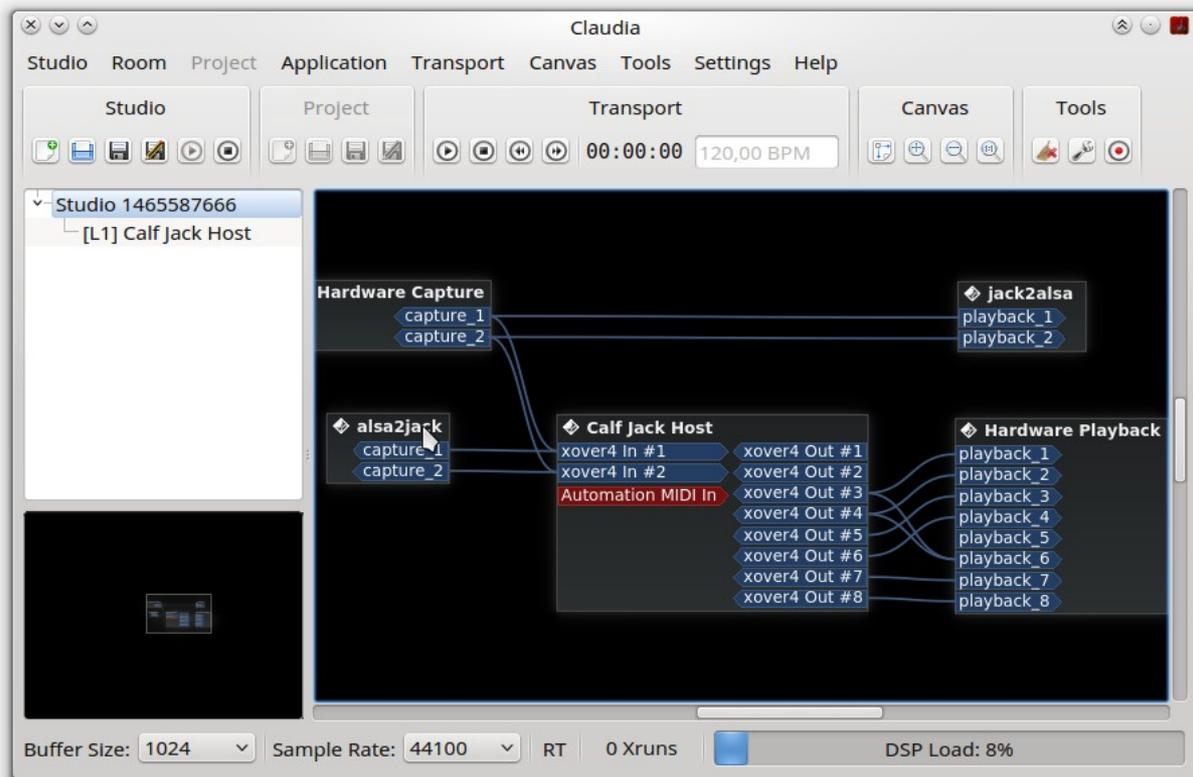
The UA-25 driver are available for Linux (default in Mint).

The UA-25 I connected by USB to my KXStudio setup (PC1).

I changed sample rate to 44100 as adjusted in the UA-25.



In Cadence Hardware Capture have to be connected to Xover In.



The UA-25 has a digital optical (TOS link) input port.
 This port I connected to a second computers (PC2) soundcard output.
 I searched for a lipsync frame on youtube.
 I played for example this stream on PC2:
https://www.youtube.com/watch?v=s_PbyRpKrRk
 I really could find no subjective lipsync delay by playing this or also other test frames or videos.
 In this case the whole connection chain was digital up to the AV-Receiver.

As an idea, I think this combination of equipment with low latency can also be used for a portable small PA System.
 All you need is a Laptop, some passive loudspeaker or driver and a AV Receiver. And maybe an external sound interface like UA-25 for the microphones.
 You don't need separate hardware equalizer, limiter, xover, amplifier.....

And you can also use this for music production.
 KXStudio, Calf gear, guitarx,are made for music production.
 You can also add and control MIDI equipment

All the streams from firefox or other steaming software have to use the loop device.
 Some outputs have to be set to alsas inside the used streaming software, if not by default.
 Firefox will do it by default.

I cannot warranty that all this will function on other pc in the same way.

Guenter